BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

Short Discussions of the Following Subjects:

MEASURING MANAGEMENT

RHYTHM IN REPETITIVE WORK

THE NEW ENTREPRENEUR

83
PERIODICAL DIVISION

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The objects of this Society are, through research, discussion, publication and other appropriate means:

1. To secure—for the common benefit of the community, the worker, the manager and the employer—understanding and intelligent direction of the principles of administration and management which govern organized effort for accomplishing industrial and other social purposes.

2. To secure the gradual elimination of unnecessary effort and of unduly burdensome toil in the accomplishment of the work of the world.

3. To promote the scientific study and teaching of the principles governing organized effort, and of the mechanisms of their adaptations and application under varying and changing conditions.

4. To promote general recognition of the fact that the evaluation and application of these principles and mechanisms are the mutual concern of the community, the worker, the manager and the employer.

5. To inspire in labor, manager and employer a constant adherence to the highest ethical conception of their individual and collective responsibility.

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Comment

THE FIRST reaction of our readers will be to question why this issue of the Bulletin should be smaller than usual. The answer is to be found in the fact that the earlier issues of the volume were larger than usual. The meetings last December and May were so fruitful that it was decided to make the papers and discussions available to our readers promptly through extra pages in the early issues of the year, and to compensate the budget by reduction in the size of the August vacation-period issue. At that we are sixty-four pages ahead of the normal number of pages budgeted for the part of the year which is past.

WE EXTEND cordial greetings to Mr. Yoiti Ueno, Director of the Institute of Efficiency, Tokyo, and Director of the Japanese Branch of the Taylor Society, and the delegation of Japanese industrialists who are now on a tour of inspection of American methods of management under the auspices of the Taylor Society. Sound principles of management are of universal applicability and we are pleased to observe such world-wide inquiry concerning them. Studies of foreign industries also help toward an international perspective which promises much for a future rationalized world industry. We regret that our industrialists do not make similar tours. If they did perhaps some of our problems of national policy which have both industrial and international significance would be solved more wisely than they now appear to be.

DURING the past month the Society has lost two of its outstanding members, Frederick L. Lamson and Henry R. Seager. A too brief sketch of the career of each will be found in the Necrology section. What we are minded to speak about at the present moment is that the chronological coincidence of the deaths of such outstanding individuals emphasizes both the variety and the community of interests presented in the membership of a society devoted to exposition of the philosophy and technique of scientific management. One was an industrial executive, the other a college professor. However, the industrial executive was of the studious, thinking type which is coming to the front; and the college professor was of the type which has interest in current industrial problems and is active in their solution. The forum of the Society is one on which theory and practice, investigation and doing, idealism and practicality, the future, the past and the present meet on common grounds.

Measuring Management

Contribution to a Round Table Discussion at the Columbus Meeting, May 1 and 2, 1930

By **WALTER RAUTENSTRAUCH**
Professor of Industrial Engineering, Columbia University

ANY PROPOSAL to measure the results of men's efforts must proceed on the following bases:

1. The object or objects to be measured must be defined in terms of their specific characteristics—particularly those characteristics which relate to their functional uses.

2. The units of measurement employed should relate to the characteristics of the things to be measured and should be commonly accepted by those who measure or deal with the results of measurement.

3. The means or instruments of measurement must be created and standardized.

4. The results of measurement should be coordinated and formulated for use in comparisons on commonly accepted standardized bases.

Let us assume, for example, that a man has made a building brick. How shall we state what he has done? Shall it be stated in terms of such characteristics as electrical conductivity, heat conductivity, chemical composition, or abrasiveness, to mention a few? Obviously not, for these characteristics do not specifically relate to the functions it is to perform. What then are the characteristics to be measured? They are color, size, weight, strength and absorption.

Color is measured by a point on the chromatic scale; size is measured in inches; weight is measured in pounds; strength is measured in pounds required to rupture under standardized conditions of load application and method of support; and absorption is measured by well known units, standards and methods of measurement. All these results definitely formulated on commonly accepted standardized bases may be used for comparing the quality of the brick in relation to its intended use. As a consequence of such procedure, the results of the brick maker's efforts may be dealt with quantitatively and improvements in processing may be measured in terms of standardized units. This is only one of innumerable illustrations which may be given to show the application of the above basic principles of procedure to the intelligent measurement of some of the common things of life.

All marked progress in human enterprise has been founded upon the principles of scientific procedure which is based on quantitative measurement of qualitative characteristics. Chemistry was born of Alchemy when the elements, their characteristics of state and behavior, were dealt with quantitatively. Astronomy was born of Astrology when men began to deal quantitatively with the size and movement of the heavenly bodies.

Modern theories of the structure of matter have rapidly risen and as rapidly fallen, as men have tested these theories quantitatively, by the rapidly multiplying and improved units and means of measurement which science is constantly devising.

Even our social phenomena are being studied with the hope of finding ways and means for dealing with this subject matter quantitatively and developing thereby some procedure for intelligent control.

The determination of a person's I.Q. through the modern intelligence tests is another evidence of man's constant endeavor to extend the field of quantitative measurement to what has in times past been regarded as unmeasurable. It is not at all out of harmony with modern tendency, therefore, that those who are concerned with the problems of management should endeavor to establish ways and means through which the effectiveness of management may be measured.

Perhaps it would be more exact to state that the endeavor is to find more accurate and more appropriate units and methods for measuring management, since there are used, of course, the rough rules of thumb such as the percentage of profit on invested capital and increase in sales volume in a given period, many of which may not measure management at all, even though they may be most important factors in the success of the enterprise. The dumb Indian who finds oil on his land and thus becomes enormously wealthy is not necessarily a good manager. The enterprise which makes a large profit under the protection of a patent monopoly may not be well managed. A company enjoying only a small profit with no expansion in sales, but operating in a highly competitive market of changing economic wants, may be most excellently managed.

Again one may ask, is a company well managed if no great personalities are developed in its environment and if those in its employ are subjected to degrading ethical and social standards, even though the profits in dollars may be all that may be desired? Have those who manage an obligation of a high order with respect of establishing standards of conduct and relationships toward and with their fellowmen, on the basis of which their managerial efforts should be measured, or have they not?

Questions of this nature raise the first problem with which we are confronted when we attempt to measure management, and that is:

What is the object or function of management and in what terms may it be defined?

Management in relation to industry is concerned with property and people. Property is defined in terms of capital wealth as expressed in the current medium of exchange. With respect of property it is suggested that the object of management is:

1. To establish and maintain the best financial structure adapted to the business requirements.
2. To make a reasonable profit on the capital invested.

With respect of the employes of industry, the object of management may readily be conceived to be:

1. To establish and maintain those relationships with employes which will best promote the growth of the character of each individual.
2. To establish and maintain those conditions of employment which promote:
   a. A sense of security—personal and as members of a group;
   b. The satisfaction of the ego—that thing which drives us to work when we do not have to, which causes us to want to create something and to seek appreciation and approval;
   c. Loyalty to a common cause.
3. To pay just wages for work done.

Management then is concerned with the growth of capital wealth and the growth of personalities into better individuals, better members of families, better members of the organization, and of the community and society. Obviously the measurement of the results of management with respect of capital wealth may be dealt with quantitatively.

The social consequences of management can not be dealt with quantitatively and therefore we must be satisfied with qualitative measurements only. We will leave this subject for the time being and return to the problem of measuring the economic aspects of management.

The Financial Structure

One of the chief concerns of management is to maintain the stability of the financial structure of the enterprise. A management which permits the fixed assets to grow out of proportion to the sales requirements or out of proportion to the working capital available is not good management. A management which obtains capital at prohibitive rates and under hazardous conditions is not good management. A management which permits excessive capital tie-up in slow moving inventory and thus jeopardizes the company's credit or demands more working capital for its operations than is normally required is not good management.

How may management be measured with respect to these and similar things? All measurement should proceed from a base or datum line. In this case, the base is the normal financial structure appropriate to the enterprise. This problem divides itself into two main divisions and these are: (1) the constitution of the assets and (2) the constitution of the liabilities.

The normal constitution-of-the-assets requirements of a business must be determined according to the demands of the particular business, especially with regard to:

a. The volume of sales;

b. The minimum capital investment required in fixed assets to produce the volume of goods sold during a given time;

c. The minimum working capital required to operate the business with due regard to seasonal fluctuation in demand.

For example, if after a competent engineering analysis of processes of manufacture and machinery available for the embodiment of the most economic processes and the most desirable rate of production to be maintained, it is found that the minimum capital requirements in respect of the rate of production or sales are as follows:

Annual sales	$1,000,000
Fixed assets	250,000
Current assets	300,000

then these requirements constitute a proper base from which to measure the effectiveness of management. Should fixed assets be increased without effecting a corresponding increase in productive capacity or increasing capacity not warranted by sales demand, then an ineffective employment of capital has occurred. Likewise, if inventory is increased beyond the required amount for the same rate of sales, then management is inefficient.

The funds through which the assets of a corporation are acquired are derived from two sources: (1) short term creditors (vendors, banks, etc.); (2) long term creditors (bond holders, stockholders in particular). Accordingly it is a province of management to keep funds from short term creditors within the bounds permitted by the current assets and to provide long term funds at most advantageous rates and least hazardous terms.

The range between desirable and hazardous, of the units of the financial structure may be set up in terms of

		Desirable	Hazardous
$\frac{\text{Sales}}{\text{Fixed assets}}$	=	A	XA
$\frac{\text{Sales}}{\text{Current assets}}$	=	B	YB
$\frac{\text{Current assets}}{\text{Current liabilities}}$	=	C	ZC
$\frac{\text{Bonds}}{\text{Stocks}}$	=	D	QD

and other similar ratios.

Accordingly, if the status of the financial structure as expressed by units of the above nature, at any given time is found to be at certain points between the desirable ratio and the hazardous ratio, then the effectiveness of management from that time on may be measured by the rate at which these ratios approach the desirable figures. Some further study is required to determine the units of measurement by which the effectiveness of management in this particular may be recorded.

The Profits

The successful management of any business must be founded upon a knowledge of its economic characteristics. An excellent manager may make only 5 per cent profit on sales and 10 per cent on the capital invested in a given business, while a poor manager operating another business of an entirely different nature may make 10 per cent profit on sales and 20 per cent on the capital invested in his business. Accordingly any judgment of management with respect of profits earned must be based on a knowledge of the profit possibilities of the particular business handled. It has been shown that the law of profits of a given business may be stated:

$$\text{Profit} = X\ (1-b)-a$$

$$\text{where } X = \text{sales in dollars}$$

$$a = \text{constant total costs}$$

$$b = \frac{\text{Variable total costs}}{\text{corresponding sales}}$$

Thus in a given business

$$a = \$90{,}000 \text{ per month}$$

$$b = .4$$

If the sales are $200,000, the profit should be

$$\text{Profit} = 200{,}000\ (1-.4)-90{,}000$$

$$= \$30{,}000 \text{ per month}$$

If in another business the constant total costs are $120,000 per month, due to the inherent characteristics of the business, then monthly sales of $200,000 would yield no profit for the business breaks even at this point.

Having established the economic characteristics of the business and determined the profit possibilities at varying volume of sales, a measure of the efficiency of management in respect of profits is found.

It may also be suggested that another factor in the rating of management is the ratio of sales to plant productive capacity, for obviously it is the responsibility of management to maintain production at capacity.

The writer at one time was chief executive of a number of plants and established for each a basis of measurement of management which proved very helpful. There is given herewith a monthly report of one of these plants.

Plant No. 1 Month ending August 31, 1929

SCHEDULE F
Analysis of Plant Efficiency

No.	Acct.	Item	Actual	Budget
1	.01	Raw materials used	$12,966.04	$15,114.82
2	.02	Direct Labor	5,197.24	5,690.50
3	.03	Foremen's Salaries	832.60	810.00
4	.04	Operating Supplies used	807.51	1,177.50
5	.05	Packing Supplies used	2,721.00	2,466.00
6	.06	Repairs Productive Depts.	1,626.00	1,660.00
7	.07	Fuel	1,088.13	1,443.75
8	.08	Steam Dept.—Labor and Expense	1,238.80	1,165.00
9	.09	" " —Repair and Maintenance	378.00	378.00
10	.10	" " —Insurance, etc.	114.83	97.00
11	.13	Power Purchased	2,322.54	2,740.60
12	.14	Elec. Power Dept.—Labor and Expense	810.15	625.00
13	.15	" " " —Repair and Maintenance	171.00	171.00
14	.16	" " " —Insurance, etc.	97.33	84.00
15	.19	Refrigeration—Labor and Expense	309.02	522.70
16	.20	" —Repair and Maintenance	208.94	204.00
17	.24	Salaries—Supervision of Plant	883.59	1,015.00
18	.25	Fixed Charges—Supervision of Plant	2,026.50	2,800.00
19	.26	General Repairs and Maintenance	525.00	525.00
20	.27	Plant Office Expense	712.79	825.00
21	.28	Trucking—Salaries and Expense	398.41	466.00
22	.29	" —Insurance, etc.	65.82	88.27
23	.30	Yard Labor and Expenses	506.55	600.00
24	.31	Liability and Compensation Insurance	81.57	93.18
25	.32	Experimental	1,250.00	400.00
26	.33	Traveling Expenses	478.40	200.00
27	.34	General Expenses	125.96	170.60
28	.36	Taxes	258.31	203.51
29	.37	Fire Insurance	471.01	381.65
30		Depreciation	2,450.07	2,569.00
31		Total Plant Expenses	41,123.11	44,687.08
32	G-24	Pounds Raw Material Used	642,566	758,125
33	G-25-26	Fillers Added	29,795	31,887
34		Goods Produced (without fillers)	464,571	486,863
35	B-1	Goods Produced (including filler)	494,366	518,750
36		Yield (34/32 x 100) %	72.30%	64.00%
37		Plant Capacity Utilized (%)	57.34%	60.18%
38		Ratio Goods Produced to Budget	95.30%	100.00%
39		Budget in Dollars		44,687.08
40		Operating Ratio Budget (38 x 39)		42,586.79
41		Plant Efficiency (40/31 x 100) %	103.56%	100.00%

ANNUAL MEETING

New York, December 3, 4 and 5, 1930

Papers already definitely scheduled: Presidential Address by Henry P. Kendall; Technological Unemployment by Paul H. Douglas; Report of the Industrial Code Committee by Morris L. Cooke, Chairman, with general discussion following the report; Maintenance of Standards by Victor S. Karabasz.

Rhythm in Repetitive Work

The Rhythm Chart as a Useful Tool

By O. A. ANDERSON
Instructor, Stanford University, Calif.

THE MOST facile reader of these lines, the psychologist says, will be the one whose eyes make the longest and most even sweeps, with the fewest fixations or pauses across the lines and down the page. Similarly, the good penman, scientists affirm, is he who has a smooth-flowing rhythm of motion in guiding his pen. Just as truly, the good athlete is one who is endowed with good rhythm—the runner with a smooth and cadenced stride has an advantage over the one with a broken and irregular pace. And as smooth-flowing effort is an advantage in reading, writing, or in athletic sports, so it may be an important asset to workmen in the shop.

Rhythm is a needed quality when efficiency in effort is wanted. This is sought in micromotion study: there shall be proper timing and sequence of motions, arm movements shall be balanced, hesitation must be analyzed and the cause accounted for. Irregular movement calls for an abnormal use of energy; exertion when sustained is fatiguing, and output suffers in both quality and amount. Efficiency demands that needless movements be eliminated and that the ones retained be done in natural swing.

The ideal condition for repetitive work is to have the workman and his task in synchronous relation to each other. A great tragedy results when the innate rhythm of a workman and the cadence of his job are at odds. An example of such a maladjustment, as recently observed in a factory, might be given. One of the employes was so flushed and strained in the work of assembling and folding corrugated boxes that the danger of being seized with apoplexy seemed near. Arm and body movements were jerky and hurried; there was trouble in maintaining the pace required by the flow of material on the endless belt. Other employes engaged with the same type of task were cool and unhurried; they were "at swing" with their job.

Rhythm is an innate quality that is distinctive in each human being. What is an easy cadence for one may be abnormally fast for another. A child learns to walk at a rate and a swing of locomotion which is determined by his own peculiar make-up. An adult frequently becomes set in his rhythms so that they are not easily adapted to various types of repetitive tasks. He is a wise placer of men who tries to match men and jobs so that they are *en rapport* with each other.

Because rhythm is an inherent human trait, it serves as a clue for analyzing the effectiveness of repetitive work. If rhythm is absent or "spotty" there is some type of maladjustment to be traced and located, just as when the functioning of a gasoline motor is not smooth. In trouble shooting for causes of poor rhythm on the part of a workman there are various sources of trouble to be checked, as indicated in Figure 1.

MINIMUM-TIME CYCLES

Step	Cycle					Typical Time
	3	8	14	17	18	
I	08	08	08	06	08	08
II	06	06	06	09	06	06
III	06	06	07	06	06	06
IV	05	05	05	06	05	05
V	05	05	05	05	05	05
VI	06	05	05	05	05	05

Figure 1

These causes of faulty performance are particular problems in themselves and have been more or less systematically discussed in management literature. The problem treated in this paper has to do with:

(1) repetitive work from the viewpoint of rhythm; (2) the standard of cadenced performance which is achievable in a task; (3) the use of the "Rhythm Chart" as a managerial tool.

		TIME.STUDY RECORD																			
		Cycle																			
Step	Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
I	Pick up piece, put in jig.	14	11	08	08	12	09	17	08	10	11	08	11	12	08	09	08	06	08	11	14
II	Set machine, start to cut.	12	09	06	21	14	16	10	06	10	07	12	08	09	06	08	11	09	06	10	12
III	Drill.	07	06	06	07	07	08	08	06	06	08	07	06	07	07	08	07	06	06	08	07
IV	Change tool, start to cut.	09	08	05	06	08	07	09	05	07	05	10	06	07	05	08	07	06	05	09	10
V	Countersink.	06	07	05	05	05	05	05	05	05	06	07	05	06	05	07	07	05	05	07	06
VI	Loosen jig, remove piece.	08	05	06	09	08	09	09	05	05	08	08	05	09	05	06	07	05	05	09	08

Figure 2

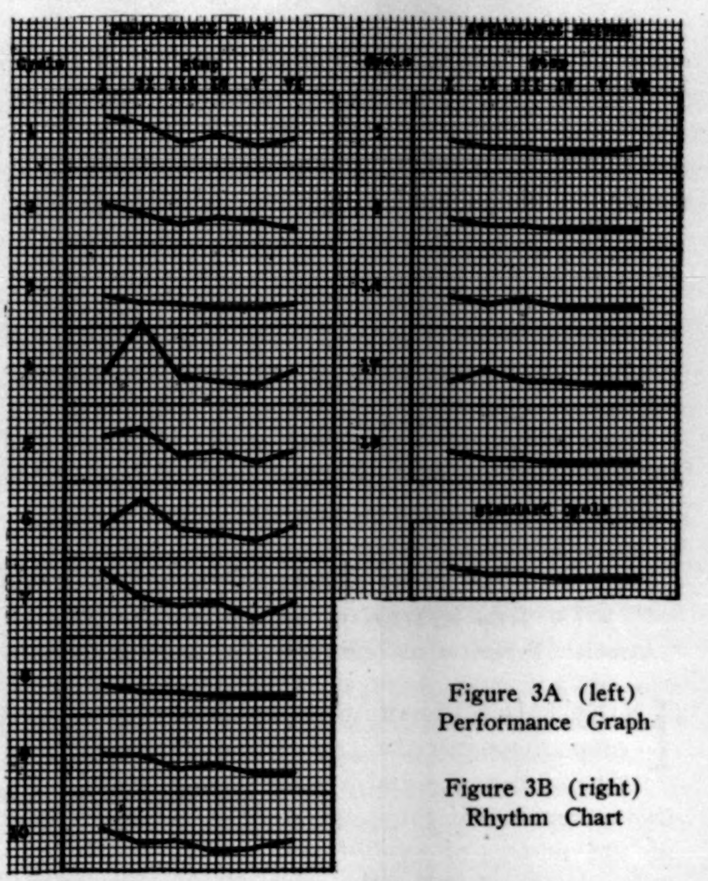

Figure 3A (left)
Performance Graph

Figure 3B (right)
Rhythm Chart

To begin with, a time-study record is needed. For purposes of illustration, a representative portion of a time-study report will be used. (Figure 2.) The various steps of a machine-shop operation are given, together with the time consumed for each step, through the course of twenty consecutive cycles. The individual time for each portion of the operation is given in terms of one-hundredth of a minute. Running time is not shown since the data are not pertinent to the topic of discussion. The character of these data, in reference to regularity of rhythm, is revealed by the graphical chart which is furnished herewith. (Figure 3A.) Only the first half of the time-study report is graphically displayed, since the sampling is sufficient to bring out certain facts which are to be noted.

Inspection of the different curves brings the following deductions:

1. The time for the steps in the various cycles is erratic. Successive curves are dissimilar in appearance.

2. Step No. II shows a particularly wide disparity of time consumed in the various cycles. The same is true in lesser degree for steps I, IV and VI. In each of these cases there is preparation and handling on the part of the operator.

3. Steps III and V, which are practically automatic, have relatively small divergence in the amounts of time taken.

4. Certain cycles, such as 3 and 8, show relatively good time for the operation as a whole.

CAUSES OF FAULTY RHYTHM

1. The sequence of the elements in a task may be poorly arranged.
2. The time duration of certain elements may be too long or too short.
3. Arrangement of tools and materials may be inconvenient.
4. There may be interfering variables in the conditions of work.
5. The person studied may be inherently awkward.
6. He may be nervous and out of condition.
7. He may need training in skill.
8. He may be "soldiering" while under time-study observation.
9. His natural cadence and that of the job may be out of gear with each other.
10. There may be a combination of causes.

Figure 4

The most significant observation to be made is that at certain times the conditions of work and the movements of the workman were such that relatively good performance was obtained. In giving attention to rhythm, it is the good or minimum-time cycles for which one searches and they are the ones to be graphically displayed. In a work-a-day situation, the relatively poor cycles need not have been pictured. Rather, the time-study as a whole should be scanned and the basic cycles, giving evidence of minimum time and uniformity in rhythm, would be selected. Even though a time-study report as a whole may show great variations in time consumed, there is a recurrence of good cycles to be found. This recurrence is illustrated in Figure 4 which gives the data for the best cycles out of the twenty used as a basis of discussion in this article. Translated into pictorial form, the data given appear as shown in the accompanying graph which is called Figure 3B.

This "movie strip" shows how the time-study results would have appeared as a whole, if a good standard of rhythm had prevailed. If a hundred or more consecutive cycles had been examined and the good cycles selected, the "strip" would have been lengthened and an ample basis afforded for the drawing of conclusions. Taking the rhythm-chart as given, it may be said:

1. A good grade of performance was secured intermittently. Twenty-five per cent of the cycles (five out of twenty) have a nearly uniform type of rhythm. It may be assumed that this standard, or a modification of it, could be achieved in consecutive cycles, should the operator and working conditions be right.

2. The "typical time," as it is known in time-study work, was derived by inspection of data from the good cycles. This typical time represents achievable performance; it was actually achieved in cycles 8 and 18, and was approximated in other cycles. The typical-time data define the character of the foundational cycle, designating rock-bottom or standard performance. The curve in the bottom space, just below the "strip," represents the standard cycle.

3. With the standard cycle defined and with a "strip" of rhythmic cycles on hand, one now has a reference or standard of comparison to be used during the search for methods and conditions needed for the yielding of consistently good performance.

4. The inspectional method for determining the typical time and the standard cycle may be used to supplement (and often displace) the usual statistical method which is employed when rate-setting is to be done. The statistical method for computing time-study results is round-about and laborious at best. It involves a study of abnormal readings and the discarding of the same, the determination of means, medians and modes from the data retained, the finding of absolute minimums for each step of an operation, the determination of selected minimums on the basis of computations made, and the calculation of deviation ratios as a check on the results obtained. In comparison, the inspectional method is direct and to the point, taking less time to execute than to explain. Used with the graphical "strip," it brings adequate attention to rhythm, which the statistical method commonly slights or does not even take into account.

Rhythm is an important factor to consider in training and placing employes who are to do repetitive work. In analyzing operations, in checking skill, in tracing causes of ineffective work, the rhythm-chart may be found useful. By comparing a standard cycle or a "strip" of relatively good cycles with the time-study performance of a given worker, his progress, fitness or sincerity of application may be objectively determined. Rhythm is inherent in the nature of tasks and of men. If an adept workman attempts to stall and "soldier" in repetitive work, rhythm will out—in spite of himself. Where a natural cadence exists, it takes conscious effort for a man to work "out of harmony" with his job; when attention momentarily lapses, he swings into the rhythm—and it shows on the chart. For the protection of employes who may be misfits in relation to certain repetitive jobs, and for the protection of management in standardizing jobs and setting rates, the rhythm-chart is a useful tool.

The New Entrepreneur

By ETHEL B. DIETRICH
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INDICTMENTS of the capitalist system by economists run the gamut of such criticism as that of Beatrice and Sydney Webb, who lament the separation of the workers from the ownership of the means of production, to W. Z. Ripley's arraignment of the policy of modern corporations, which separates the stockholders from the control of their capital. Who is it then who rides in the saddle? Has an entrepreneur arisen to control industry who neither works with his hands nor provides the necessary capital?

In reviewing industrial history, the shifting tenure of the entrepreneur becomes clear, though his function remains always the same—to direct the employment of capital and labor to meet the demands of consumers. From the days of primitive industry to the decline of the craft gilds, skill was the limiting factor, and the craftsman who possessed it administered productive enterprises. Though he maintained high ideals in the matter of quality of product, since it bore testimony to his prowess, what an autocrat he became on matters of price, apprentices and politics!

With the appearance of power machinery, the craftsman was overthrown, for possession of capital became more important than the possession of skill, and he who controlled it rose to power. Usually the entrepreneur was a representative of a personal or family fortune and, though the size of the industrial unit was increased in the transference from workshop to factory, his personal influence did not extend beyond the neighborhood in so far as financial or labor relationships were concerned, until the latter part of the nineteenth century. In this country he was best typified by such personages as Andrew Carnegie and his associates—men who dealt with tangible capital and who built vast personal fortunes by dint of their own plans and with the use of their own or borrowed capital. Their sway was over their own property and their methods "rule of the thumb."

When, during the eighties, there was a shift from the happy period for producers when markets were outrunning production to one in which production was outrunning markets, industrialists were faced with two possibilities—to deepen markets or to curtail output. The latter was the most obvious and simple method and its adoption led to the trust era of the last decade of the nineteenth century. During this epoch the key man was not the producer, the man interested in building furnaces or railroads, he was the financier, the man with the promoter's instinct such as Gary and Morgan, who could unite great enterprises in order to contract them—to increase value by restriction of the use of capital and labor in industry.

Such a situation, however, was distasteful to Americans who cherished vaguely notions of liberty, who still believed in the tenets of the *Wealth of Nations*. With the Sherman Act, strengthened by the Federal Trade Commission Act and the Clayton Act, a new period was inaugurated in which industry was forced to return to a competitive basis; broadly interpreted, however, by the United States Supreme Court under the "rule of reason." Though the consequences of this new legislation did not follow immediately because of war conditions, they were apparent by 1920. Since production could not be restricted legally, it had become necessary to dispose of the increasing output by expanding wants through advertising and by cheapening prices through the reduction of costs.

The publication of the study, *Waste in Industry*, by the Federated American Engineering Societies was an immediate response to the need. According to its findings, management was responsible for 50 per cent of the millions of dollars wasted annually. It seemed incredible. Plainly the times called for a new entrepreneur, interested in industrial technique rather than financial problems, in order to reduce the burden of waste and to devise more efficient methods of production. Moreover, new opportunities were at hand. During the war years, the sciences in their relation to industry had passed swiftly from the theoretical to the applied stage—chemistry in the field of synthetic raw materials, physics in engineering and in the uses of electricity, psychology in the development of trade tests and in the analysis of consumer susceptibility, physiology in the study of fatigue and industrial health, economics in the fields of forecasting, statistical research and cost accounting.

The government also, under the leadership of Herbert Hoover in the Department of Commerce, had developed a new constructive policy and was ready to assist. Both the Division of Simplified Commercial Practice and the Federal Trade Commission through its trade practice conferences were fostering self-government of industry, while foreign trade was stimulated by the establishment of the posts of Commercial Attachés and Trade Commissioners and the sanction of exporting associations formed under the Webb-Pomerene Act.

To comprehend and administer business enterprise in such a *milieu* required not only experience but a wide knowledge of the scientific method in various fields. Industrial management had become a profession, to which the Taylor Society, the Harvard School of Business Administration, the appointment of Henry S. Dennison and Sam A. Lewisohn as Vice-Presidents of the American Economic Association and the award to Henry Ford by the Franklin Institute bear witness.

The economic use of these new services made necessary larger industrial units—giants in comparison to the factory of Arkwright—and resulted in the development, with all its ramifications, of mass production which, together with Taylor's conception of scientific management, is America's contribution to the history of industrial management. Except in the case of Henry Ford, the unclassifiable, the need for a great aggregate of capital, as exemplified in the billion dollar corporations, has spread ownership over a vast array of people, from the workers through stock ownership to innumerable investors on the stock exchanges without knowledge of or capacity for management. Hence, no longer is the entrepreneur a self-appointed head but a servant of the corporation, chosen not because he possesses skill or capital but because he is an industrial scientist with vision and imagination to comprehend the intangible as well as the tangible elements of modern civilization.

Owen Young in his dedication address at the Harvard School of Business Administration spoke of a future in which the workers might look forward to the employment of capital, meaning "the men who are giving their lives and their efforts" to the great business organizations. More broadly interpreted, this must refer to the right to choose the entrepreneur, since the day has passed when either worker or capitalist as such can assume the professional duties of management. Like the alchemist who mixes the potions, the entrepreneur performs an esoteric function in combining labor and capital effectively to supply consumer wants.

Reviews

The Filene Store. A Study of Employes' Relation to Management in a Retail Store. By Mary La Dame, Russell Sage Foundation, New York, 1930, pages 541.

The student of the science of administration feels keenly the need for first-hand studies of companies which have made experiments with new forms of employe relations. The Russell Sage Foundation has here supplied such a study which is of unprecedented value. This value derives both from the importance of the experiment studied, and the unusual competence of the analysis.

The Filene store in Boston has long been known for its effort to afford a new and larger share than is typical of employe participation in management, in profits and ultimately in ownership. About such an effort all the inevitable and necessary questions arise for answer: Does employe sharing in management help or hurt? Does employe sharing in profits supply a genuine and wise incentive, and if so what form should it take? How can employe participation in ownership be evolved to assure permanence of wise direction? How can the continuance of progressive and experimental labor policies be assured in companies where these policies are initially inspired by one or two owners or executives when they pass away or sell out?

This volume purports only to answer these questions so far as the Filene experience down to January 31, 1927 sheds light upon them, which it does in a most helpful manner. Miss La Dame is to be congratulated from every point of view. Her outlook is broad without being extreme. Her criteria are social but kept well within the scheme of possible objectives under the existing economic order. Her facts are clearly stated and her conclusions apparently sound deductions from the available data. Her background understanding of contemporary developments in the field of personnel experience seems complete enough to relate this company's efforts to the trend of the times with similar programs.

Perhaps the outstanding fact of this study is its warning that we today face no assurance—and seem hardly to have thought of finding one—as to the continuation of personnel policies and experiments when the leaders and inspirers of them pass off the industrial scene. Many of us have observed it as unquestionably true that the initiation of significant personnel achievement depends on owners and executives possessed of rare idealism, vision, courage, patience, intelligence and insight. But fewer of us have honestly faced the dilemma met when such leadership is withdrawn, as it has been essentially in this case and with a few others that might be cited. Yet it becomes increasingly clear that mergers, bank domination of companies, the selling out of family companies to a broadened ownership—that these and other active factors are in danger of leading to the abandonment of companies' commitments in the personnel field which seem sound and forward looking.

Because of certain shifts in ownership in the store under examination such a lessening of the power and direct influence of the Filene brothers is already a fact. And Miss La Dame appears to draw the conclusion that as a consistently well thought through personnel program, this company's effort is really a thing of the past by the time her study reaches the public.

Another outstanding conclusion is as to the difficulty of getting genuine and widespread interest among employes in managerial affairs and of getting any important assumption of managerial responsibility by them. This conclusion is not surprising. It confirms the observation and experience of other managements which have labored over the same problem. The author shows how this condition might possibly have been minimized by a more specific educational technique.

But the fact remains that those who "view with alarm" the extension of employe influence through employe representation seem to have set up a man of straw to take fright at. And employe representation still remains as at least immediately valuable as a channel of expressing employe attitude and desire on certain matters, even if it fails as yet to open up promise of a method of employe assumption of any important managerial authority. To be sure, the extent to which this last objective is desirable may be questioned. But it was an aim definitely striven for in the Filene store.

As a brief for a modern personnel program, however, this study is impressive. Whether or not all the hopes of the Filene brothers were being realized, they were supplying a convincing example of corporate and human benefits growing out of the best kind of modern personnel work. The courage they showed, the faith in employe good sense and business judgment which they evidenced, the investment in specialized personnel techniques which they were willing to authorize—all these seem to have been abundantly justified.

One only wishes that conditions had been such that the personal efforts of these two men themselves could, as the store grew, have been kept closer to the actual conduct of personnel affairs. That they were not able to convince their close executive associates of the wisdom of their vision seems retrospectively to have been the cardinal failure. Rather than demonstrate the fatuity of the vision they cherished, the results seem to show the essentially personal character of much that is valuable in managerial-worker relationships. Much can no doubt be done through forms, structures, constitutions and procedures which can be given permanent, legal effect. But regardless of corporate forms and basic ownership assumptions, experience in Russia as in Germany, England and America proves conclusively that administrative measures in their going effectiveness are the lengthened shadow of a man or group. And no economic structure, however set up, is led more intelligently and co-operatively than its leaders are intelligent and co-operative. If this be deemed a discouraging conclusion, well and good. But this study supports such a conviction and seems to me the more significant and worth while for that reason. If the truth is that industrial progress depends upon high-minded leaders, then upon the problem of developing high-minded leaders must our attention be centered.

Miss La Dame's provocative study supplies support for this thesis. And although this is only one phase of a many-sided analysis which should be read to be appreciated for its numerous conclusions, it is a phase which perhaps merits the most universal concern. For this may well prove to be the central problem now to be faced by all who wish to advance in a fundamental way the science of good management.

ORDWAY TEAD[1]

Is It Safe to Work? By Edison L. Bowers, Houghton Mifflin Company for the Pollak Foundation for Economic Research, Boston and New York, 1930, pages xiii, 229.

After a decade or so of the annual bickerings over liberalizing our workmen's compensation laws, it is refreshing to encounter the unselfish and non-partisan views of an economist who, through the murk of legislative compromise, discerns an objective more satisfying than the rehabilitation of cripples and more to be desired than adequate compensation for loss of earning power and dependency.

Edison Bowers believes in the efficacy of the safety movement and in its concomitants of efficiency and larger production, lowered costs and improved labor relations. At the same time, however, he recognizes how scattered have been its really notable advances in the industrial field. Yet engineering and educational ability is not lacking, he says, to consolidate and extend these gains. The vital deficiency lies in the failure of so many employers to sense their obligation to society for the protection of the earning power of the State, and to realize the benefits returnable to them as dividends on very modest investments in accident prevention. But the present compensation laws have lost their virtue as inducements, and insurance principles have tended merely to level the extremes of industrial practice. Can we expect the executive to attach much importance to an expense item which is equivalent to but 1 per cent of his payroll?

After pointing out how far the benefits awarded under the present laws fall short of yielding a fair compensation for loss of earning power and dependency—and how the economic corollary of rehabilitation has faltered and lagged, Bowers introduces the major tenet of his thesis. "The principal reason why more money is not spent for injury prevention," he declares, "is that the employer is not compelled to do it. . . The injury expense is relatively small because injury benefits are small. Injury benefits are small because human beings are not rated at their true economic worth. If industry had to pay the actual loss caused by industrial injuries, the safety problem would loom large in the average company's affairs; the tactics employed in preventing injuries would correspond to the new importance of the enterprise." And, not only must benefits (and the insurance premiums which cover them) be larger, he points out, but the differential must adequately separate the more hazardous from the less hazardous plants and, through the pressure of competitive costs, actually force the former to reduce their accident rates. And so, by changing the basis and increasing the scale of benefits, is the safety movement to be accelerated, more adequate compensation provided, and the way prepared for the needed extension of rehabilitation work. Bowers believes such changes are bound to come and that they will produce in the end no appreciable increase in the costs of industrial products.

The title of the book is somewhat misleading and one might find fault with the publishers' statement on the jacket that it contains "clear and practical suggestions for the prevention of accidents"—which was obviously not the intention of the author. To some, the detailed discussion of schedules and benefits may seem unnecessarily prolonged. The source of the subject matter is not always made clear; the index is rather slim and the bibliography is not quite up-to-date. But these are minor criticisms; the author has a real message to deliver and delivers it fluently, clearly and with effect. The book contains so much food for sober thought by those concerned with the human element in

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